PART

1

Ontario

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Factsheet

HORSE MANAGEMENT
CARE OF YOUR HORSE'S FEET PART 1

The material in the Factsheet was originally published by the University of Missouri-Columbia Extension Division. Additions and revisions by Dr. R. G. Wright and S. Slater-Pratt.

Foot care is one of the most neglected horse management practices (Figure 1). Most lameness that impairs the usefulness of a horse can be prevented by proper foot care and reasonable management.

Foot care should be as routine as feeding and watering. It should include:

1. Routine cleaning,
2. Periodic trimming,
3. Corrections of minor imperfection, and
4. Treatment of foot diseases and injuries.

Most foot care practices can be done by the average horse owner. It is, however, important to know when to seek the help of a professional, especially for corrective shoeing and disease treatment and control.

To understand proper care of a horse's feet, first study and understand the structure of the foot and the functions of its various parts. The major parts of a horse's foot are the hoof wall, coronet, sole, frog and the internal structures such as the bones, cartilages, tendons and connective tissue. Internal structures will be discussed briefly in this Factsheet.

Hoof Wall

The hoof wall is a horny substance made up of parallel fibers (Figure 2). It should be dense, straight, and free from rings (ridges) and cracks. Viewed from the side, the wall at the toe should be a continuation of the slope of the pastern.

The main functions of the wall are to:

1. Provide a weight-bearing surface not easily worn away.
2. Protect the internal structure of the foot, and
3. Maintain moisture in the foot.

Usually, the hoof wall is thicker at the toe than at the quarter and heel. The hoof wall is protected by the periople, a varnish-like coating that holds moisture in the hoof.

Coronet

The coronet, or coronary band, is the source of growth for the hoof wall. It is directly above the hoof wall and is protected by a thick layer of skin and dense hair. A healthy foot will grow about 3/8 inch per month. A change in the rate of growth of the hoof can be caused by a change in the amount of exercise, the ration, the onslaught of illness, and the general state of health and condition of the animal. Injury to the coronary band can result in irregular growth of the hoof wall and can develop into a permanently unsound hoof wall.

The hind feet may grow faster than the forefeet, and unshod feet may grow faster than shod feet. The feet of mares and geldings seem to grow faster than those of stallions.

Sole

The sole of the foot is a horny substance that protects the sensitive inner portions of the foot. It should be firm, slightly concave and of uniform texture. The horse has no feeling at the exterior sole surface.

A flat-footed horse tends to receive more bruises and injuries to the sole. Also, horses that have experienced

Figure 1. A case of neglected feet. Shoes have been left on too long allowing the heels to overgrow the back branches of the shoes. Re-set shoes about every six weeks.

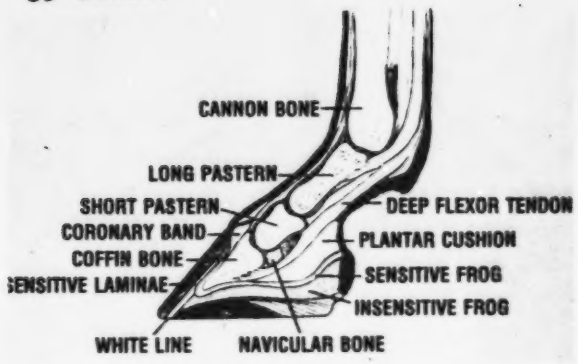

Figure 2. Anatomy of the foot.

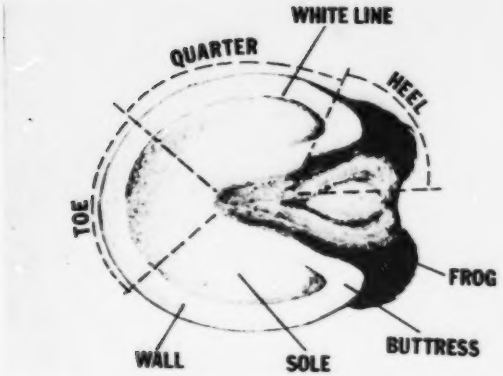

Figure 3. Parts of the ground surface of the foot.

founder and have developed a dropped sole are more easily bruised at the sole.

Frog

The frog, located at the heel of the foot, forms a "V" into the center of the sole (Figure 3). The frog is a spongy, flexible pad and is also a weight-bearing surface. It is the intermediate organ between the plantar cushion and the source of pressure from the horse's weight. The frog is differentiated from the sole of the foot by two lines called commissures.

The condition of the frog is generally a good indication of the health of the foot. Without proper flexibility, expansion and ground contact, the frog cannot perform its function in complementing the circulation of blood and the absorption of shock throughout the foot.

Internal foot structure

To be able to provide proper foot care, first gain an understanding of some of the important internal parts of the foot and their functions.

Coffin bone — provides the shape of the foot and the rigidity needed to bear weight.

Plantar cushion — expands and contracts to absorb shock and pumps blood from the foot back towards the heart.

Navicular bone — serves as a fulcrum and bearing surface for the deep flexor tendon which is responsible for extension of the foot as it progresses through a stride.

Sensitive laminae — serve as a means of attachment for the hoof wall and the coffin bone and also as the main area of blood circulation within the foot.

Routine Foot Care

Disease organisms concentrate where animals are confined, so cleanliness is important. Horses kept in a stall or small pen should have their feet picked or cleaned daily to reduce the risk of thrush. Thrush is the condition resulting from bacterial penetration into the frog and surrounding area. The bacteria produce a foul odor and cause the frog to become soft and mushy. If allowed to go untreated, serious lameness can result and extensive treatment will be necessary.

Routine daily foot care means regular use of the hoof pick to clean the horse's feet. A fine bristled wire brush is also useful for cleaning the sole, frog, and hoof wall. Take care not to damage the periople with too much pressure from the wire brush; the result would disturb the moisture balance of the foot.

Handling the feet

Learning and practicing safe handling of the horse's feet are important steps in performing routine foot care. Horses should be taught early in life to yield their feet.

Most horses are worked more from the left side than the right, so begin working with the left front foot. Rub down the leg toward the foot with your right hand while your left hand is on the shoulder. Push off with your left hand if you need to move away.

Squeeze the tendon to get the horse to yield the foot if it won't do so otherwise. Move the hand in front of the canon of fetlock as the foot raises. Position the foot firmly between your knees. If the horse struggles and wishes to regain its foot, let it do so. You can't hold a front foot if the horse rears. Repeat the procedure until the horse learns to yield its feet willingly.

To lift a hind foot, keep one hand near the hip and go down the leg slowly with the other (Figures 4 and 5). Work in close to the horse. Pull forward on the canon until the horse yield its foot. If you feel tense muscles, go more slowly. Step promptly under the raised foot with the inside leg and pull the foot into your lap. Lock it in place with your elbow over the hock and your toes pointed towards each other. Hold the foot in this position so both hands are free to work.

Foot cleaning

When picking the foot, use a hoof pick and clean from the heel toward the toe, being especially careful to clean the commissures on each side of the frog and the cleft of the frog itself. Don't attempt to open the heel excessively as this weakens the area and interferes with proper contraction and expansion of the heel.

Figure 4 Pick up the hind feet with care. Brace with one hand against the horse's hip while you work down the leg with the other hand. With the horse relaxed, lift the foot forward and step under it with your inside leg.

Figure 5. Proper position when holding the hind foot. With the hock under the arm pit, ankle on knees, and foot backward (upward) the horse will submit to foot care.

After riding, clean the sole and check for gravel or other foreign objects that could be lodged in the natural depressions of the foot. A nail, gravel, stick, or other object can work into the foot and cause lameness of long duration. Objects have been known to exist in a horse's foot for as long as a year before emerging at the heel or along the coronet. When a foreign particle emerges at the coronary area, a sore, called a quittor, usually develops. This problem can easily lead to serious infection.

Maintain moisture in feet

Moisture in the horse's feet helps to maintain flexibility and prevent cracking. Most of the moisture needed in a healthy and well-protected foot can come from within.

Extremely wet conditions such as muddy lots or wet stalls promote rapid drying of the feet; the natural oils and protective films of the foot are eroded from constant contact with external moisture. Large horses with small feet commonly have hoof dryness problems.

One way to maintain proper moisture in the foot is to regularly apply a good hoof dressing containing some animal fat such an lanolin. If the dressing is not a petroleum derivative, it can be massaged into the coronet, the frog and the sole as well as on the hoof wall. The dressing helps to keep the sole pliable and eliminate dead tissue around the frog and heel. Also, massaging the coronet stimulates growth of a healthy new hoof wall.

REMOVING LOOSE AND OLD SHOES

Clinches of old nails must be cut or straigtened to remove the shoe. If the shoe is pulled without this operation, it will not only be more difficult to remove, but the walls of the hoof may be injured. Clinches may be cut with a clinch cutter or rasped off. Use an old rasp no longer used to level the foot. Place the blade edge of the clinch cutter under the clinch and straighten it by light hammer blows. If you have difficulty getting it started, lean the top out and use the back corner nearest your hand.

If the fine side of a rasp is used to rasp the clinches off, use care so as not to damage the hoof wall, because it has a protective coating to conserve moisture in the hoof. Handle the rasp to avoid damaging the coronary band at the top of the hoof. If the hoof wall is rasped very far above the clinches, a change in technique is indicated.

Place the shoe pullers under the shoe at the heel and push down toward the toe to remove the shoe. This manipulation is repeated on the opposite heel, always working toward the toe, until the shoe is completely free. Don't pry sidewise because of the danger of sprains to your horse's tendons.

If you find the above method difficult, complete the first step and then drive the shoe back down on the hoof exposing the nail heads. Nails than can be pulled one at a time.

SUMMARY OF HOOF CARE HNTS

- Begin when foal is only a few months old.
- Keep feet well rounded.
- Exercise foals on dry ground to allow natural wear.
- If kept in stall, rasp down every 2 to 3 weeks.
- Clean soles and clefts of frog frequently.
- Do not pare out sole, just clean.
- Do not trim away healthy frog unless there is clearly an excess.
- Keep foot straight with angle of short pastern.
- Hoof-to-ground angles should be approximately 45°.
- Rasp sharp edge of hoof wall to make bearing surface approximately true thickness of wall.
- Do not rasp outside wall.
- Rasp in such a manner that the heel is included in each stroke.

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PART

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Factsheet

HORSE MANAGEMENT

CARE OF YOUR HORSE'S FEET PART II

The material in this Factsheet was originally prepared by the University of Missouri-Extension Division and by the Horse Industry Branch, Alberta Agriculture. Additions and revisions by Dr. R. G. Wright, Co-ordinator for Equine Program.

TRIMMING MAINTAINS FOOT BALANCE

Trimming of feet is important, though not needed as frequently as cleaning. Trimming should be done at approximately four-week intervals on horses kept in stalls or paddocks. Horses heavily used or in pasture require approximately six-week internals between trimming.

The main goal in trimming is to retain the proper shape and length of the foot. Most people should feel comfortable in cleaning feet, (Figure 1), pulling shoes and trimming feet while they wait for the farrier.

The bottom of the foot should be kept level and the inside and outside walls should be maintained at equal lengths. The toe of normal feet and pasterns should be 3 inches long; the quarter, 2 inches; and the heel, 1 inch.

The hoof wall should be trimmed with nippers to remove excess length, then a rasp should be used to smooth and level the bottom of the foot. Be sure to rasp from the heel through the toe with each stroke to prevent uneven areas in the hoof wall (Figure 2).

The white line is external evidence of the lamination (sensitive laminae) between the hoof wall and the coffin bone. The sole of the foot is usually of uniform thickness in a normal horse. Because of that, the sole should not be trimmed to an unnatural shape. To do so would cause parts of the sole to be dangerously thin and tender.

Trimming the sole, referred to as lowering the sole, is done to keep the pressure on the hoof wall rather than on the sensitive inner parts of the foot. The dead, flakey tissue should be trimmed from the sole. Live tissue, elastic when stretched between the fingers, should not be trimmed away (Figure 3).

Don't trim the frog excessively; it should contact the ground with each step. Trim the frog only enough to remove dead tissue and to provide a uniform and adequate fissure along the junction of the sole and the frog.

After the bearing surface has been rasped to a level surface of proper length, the edges of the wall should be rounded if the horse will not be shod. This prevents chipping and peeling as the foot contacts rocks, logs or other obstructions.

MAINTAIN HOOF WALL ANGLE

Maintain the proper angle of the hoof wall in relation to the ground and the angle of the pastern. Shoes that are left on too long change the angle of the foot relative to the pastern and can cause lameness. When possible the angle of the hoof wall should approximate the angle formed by the shoulder and the pastern—usually 45 to 54 degrees.

Since the hoof wall is narrower at the heel than at the toe, heels wear first, whether the horse is barefoot or on shoes. Low heels put more stress on the tendons of the leg. If a horse is shod at a 50-degree angle, this angle may change. A 50-degree angle might be down to 46 or 47 degrees in four to six weeks. This greatly affects the action of the horse and puts more strain on tendons and ligaments.

As the hoof grows larger, the walls at the heels will overlap the shoe. When a shoe presses on the bars, there is serious danger of producing corns in the foot. Running a horse with shoes that have been left on too long also can cause bowed tendons. Regular trimming and shoe re-setting are essential in avoiding these problems.

Foot angle varies from breed to breed and much variation is found among horses of the same breed. Generally, the Western breeds have steeper pasterns and a greater angle at the ground than the other breeds. Unless some correction is needed, as in *forging* and *scalping*, the foot should be trimmed to its natural angle because any change would result in stress in other areas of the column of bones of the leg.

Trim the heels low enough to promote expansion and prevent contraction of the heels. The main concern is to trim often enough to prevent cracking and uneven wear which could eventually contribute to the improper set of the feet and legs. With a little practice, most horse owners should be able to routinely trim horses feet that do not need corrective work. It is wise, however, not to take a chance on compounding a problem on horses that need corrective trimming. To prevent harmful mistakes, seek the help of a professional farrier when trying to correct an improper turn or set of the feet and legs.

CORRECTIVE TRIMMING

The most common deviations from a normal set of feet and legs are *toe in* (pigeon toed) and *toe out* of either front or rear feet. Other problems commonly helped by trimming are cocked ankles, buck knees, calf knees, sickle hocks, and slight rotations of the cannon bone. Also, some common faults in movement of feet in stride—forging, scalping, interfering and

Figure 1 Clean the feet daily. Pull the pick away from the frog and heel toward the toe.

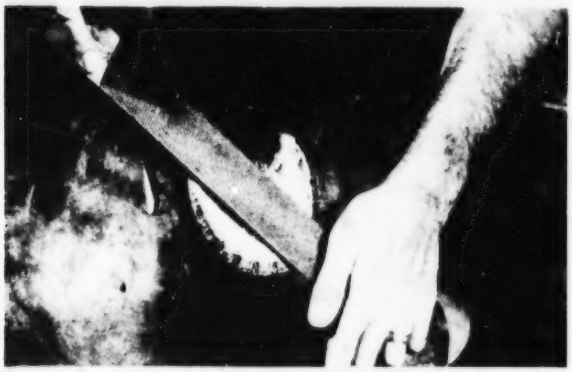

Figure 2 After using the nippers, level the foot by rasping. Be careful to leave both walls the same length.

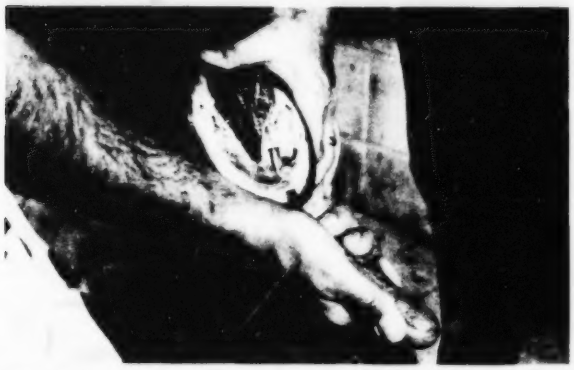

Figure 3 After leveling the hoof, lower the sole so the hoof wall bears the weight of the horse.

brushing—are corrected by careful trimming.

The most important aspects of good foot care are regularity, frequency, cleanliness and the use of proper corrective measures.

Scalping – The toe of the front foot hits the hairline at the coronary band or above on the hind foot of the same side.

Forging – This is a defect of the trotting gait in which the toe of the hind foot overtakes and strikes the bottom of the front foot of the same side at the moment the front foot is starting flight.

Toe In (Pigeon toed) – This is a position of the feet in which toes point toward one another when viewed from the front.

Toe Out (Splay footed) – When viewed from the front, the toes point away from one another.

Interfering – This is a fault of gait that causes the horses to strike any part of the inside of one limb with the inside of the foot or shoe of the opposite foot.

Buck Knees (over in the knees) – The knee has a forward deviation.

Calf Knees – The knee (carpus) deviates backwards placing excessive strain on ligaments.

Sickle Hocks – When viewed from the side, the angle of the hock joint is decreased so that the horse is standing under from the hock down.

Brushing – This is a general term for light striking, especially as interfering or forging.

COMMON CAUSES OF FOOT LAMENESS

This section is included to give the reader a background concerning the recognition, cause, treatment and outcome of the common conditions which produce lameness in the horse. An attempt has been made to keep the information practical and in language the layman will understand. However it is necessary to refer to anatomical, conformational and physiological aspects of the horse in order to give accurate information. Refer to Figure 2 and 3, Part I of the factsheet.

Many and varied treatments are available for lameness, once an accurate diagnosis is made. Diagnosis may be as simple as a physical examination done by your practising veterinarian or as complicated as special radiographic tests at a veterinary teaching hospital. Treatments vary from simple rest to complicated surgery, with corrective trimming and shoeing, anti-flammatory drugs, bandaging, cold hosing, acupuncture, electrical stimulation and many others coming in between. It must be remembered that an accurate diagnosis is the first step in any case, and veterinary services should be used.

Most lameness, particularly of the forelimbs, is found from the fetlock down. In the hind limb, the hock is often involved. As in any case of lameness, start to look for causes from the foot up.

Stone in the Foot

This occurs suddenly, and usually while at work, particularly on a gravel road. Stones often lodge between the shoe and the frog causing considerable discomfort. Stones should be removed immediately before further damage can occur.

Bruised Sole

This is direct injury of the flat of the hoof or sole by stones, irregular ground or injury. Bad shoeing may also cause this. Rest and corrective shoeing are usually all that is needed. If unresponsive, veterinary assistance should be sought.

Corns

Corns are the result of bruising of the sole between the bar and the hoof wall. This is most often the result of poorly fitting shoes or neglect to have the horse re-shod at reasonable intervals. Corns can be simple and classified as dry, or they can become infected. Dry corns are treated by relieving the

pressure. Remove the shoe, clean the foot thoroughly and reapply a 3/4 length shoe, or rest without shoes if possible. If the corn is infected it will appear moist and be draining serum or pus. In these cases veterinary assistance should be obtained.

Pricked Foot or Puncture Wounds of the Foot

Puncture wounds of the foot are common and can cause severe lamenesses that may lead to permanent disability or death if not properly treated. As with any wound that allows bacteria to enter the body, there is a serious threat of infection occurring, necessitating veterinary care to prevent serious consequences (e.g. tetanus). Abscesses can develop in as little as two days following the initial injury. Often the site of puncture is very difficult to find by visual examination; a hoof knife, hoof testers and/or radiographs can be used to locate and evaluate the injury. The outcome of foot punctures depends on the area of the foot affected, the type of puncturing object, and whether secondary infection occurs. In all cases early veterinary care is essential to evaluate the damage done and prevent further damage from occurring.

Hoof Cracks

Hoof cracks, extending from the ground surface upward, are common problems in horses' hooves which are not trimmed or are excessively dry. Injury to the hoof forming tissue at the coronary band can also result in cracks; these extend from the coronary band downwards. Severe lameness can be produced if bacteria enter the cracks and gain access to the sensitive structures of the foot causing infection. Cleaning and treating of the crack, followed by proper trimming and shoeing can be used to alleviate the condition until the hoof wall grows out (about 1 cm growth per month). The application of fibreglass or plastics to the hoof wall can also produce excellent results when applied by a competent farrier or veterinarian. Hoof cracks can usually be prevented by periodic hoof trimming and preventing the hooves from becoming excessively dry and hard. Standing a horse in water or mud periodically will help to keep its feet soft. The application of hoof dressing is helpful to prevent moisture escaping from the hoof; however these should be applied to hooves already dry. Neat's foot oil is an excellent agent for moisturizing dry hooves.

Thrush

Thrush is a bacterial infection of the frog and sole of horses kept in unclean conditions. Affected feet will have a very offensive odor and will show a black discharge around the frog. Lameness will result if the condition is allowed to progress far enough to affect the sensitive structure of the foot. Proper cleaning and trimming of the foot along with proper stable sanitation will remove the cause of the infection. Affected horses can be treated by cleaning and trimming the foot and disinfecting it with a phenol or iodine solution. The foot can also be packed with cotton soaked with 15 per cent sodium sulfapyridine solution.

Laminitis or Founder

Laminitis is an inflammation of the laminae that bind the hoof wall to the coffin bone. The causes of laminitis are varied and in many cases obscure. The commonly recognized causes are:

- overeating of grain
- ingestion of cold water by a hot horse
- retained afterbirth
- overfat horses (especially shetland ponies)
- idle horses pastured on lush green pasture (especially if clover or alfalfa are present)

Regardless of the cause, the signs of laminitis will be similar. In the early or acute stages the hoof and coronet will be hot, the horse will often sweat and will be reluctant to move. Because the front feet are usually the most severely affected, the horse will be camped out in f nt (front feet out in front of the body) and camped under (hind feet well under the body) behind in an attempt to remove weight from his front feet. In cases where all four feet are affected the horse will stand under himself both in front and behind as though he were attempting to balance on a barrel.

In advanced or chronic cases of founder there is usually an exaggeration of the ring formation on the hoof wall and there will be decreased arch to the sole (dropped sole). In severe cases the coffin bone will protrude through the sole. The afflicted horse may spend most of his time lying down. A chronically foundered horse will exaggerate his attempts to land heel first while in motion.

Treatment of early laminitis varies with the cause. Whenever a horse is suspected of having laminitis a veterinarian should be called immediately and the horse exercised (mild exercise) until the veterinarian arrives.

If not severely affected, horses with chronic laminitis can be useful for most types of work if proper foot care is instituted.

Navicular Disease

Navicular disease is lameness of the front feet caused by injury to the navicular bone. It is a very common lameness, particularly in breeds which have genetic defects in conformation. Defects in conformation such as upright pasterns and straight shoulders and/or small feet impair the shock absorbing mechanisms of the front legs and predispose the horse to navicular disease. Similarly, heavy use on hard ground will increase the probability of navicular disease. Affected horses are usually lame in both front feet. Because of the pain they will alternately "point" or advance one front foot at a time to remove the weight from it and thus reduce the pain. In the early stages of the disease, resting the horse can make the symptoms disappear, but when returned to work the horse will soon become lame. Eventually, the affected foot or feet will become smaller than normal, the walls steeper, the heels contracted and the frog shrunken because the horse will attempt to reduce the pain by landing toe first rather than heel first as he moves. Corrective hoeing, pain killers and neurectomy (cutting the nerves to the back surface of the foot) can prolong the useful lifespan of the horse. Accurate diagnosis and treatment of navicular disease requires radiographic examination of the navicular bone in the horse's hoof, but at present there is no known cure for the condition.